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New faunistic records of the family Mycetophilidae (Insecta, Diptera) from Morocco

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Abstract

A total of 54 species of Mycetophilidae are recorded for the first time in Morocco, of which 38 species are new to North Africa. A first checklist of Moroccan Mycetophilidae is appended, containing 64 species in 25 genera.

Keywords

Beni Snassen, checklist, fungus gnats, Middle Atlas, Mycetophilidae, North Africa, Rif

Introduction

The family Mycetophilidae belongs to the superfamily Sciaroidea and is the most abundant and diverse family of fungus gnats worldwide, comprising more than 4500 species (Pape et al. 2011). Adult fungus gnats are associated with humid areas, especially moist woodlands. They are usually found in shady and moist habitats such as cavities and root systems of fallen trees, overhanging stream banks, and among undergrowth of woods (Søli et al. 2000). As larvae, most mycetophilids develop in fungal fruiting bodies, both terrestrial and saproxylic, or in fungal mycelia in dead wood and soil litter, while a few species develop in myxomycetes, and others in rotten wood, bryophytes, bird's nests, or caves (Hutson et al. 1980; Yakovlev 1994).

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The fungus gnat fauna of Morocco is practically unknown. The first information on Moroccan Mycetophilidae dates back to Séguy (1941) who described a new species *Rymosia exornata* based on a female collected in the High Atlas and which was placed later in synonymy with *Exechia fulva* Santos Abreu, 1920 by Chandler and Ribeiro (1995).

Five species, without given localities, were recorded by Chandler (1994): *Leia bimaculata* (Meigen, 1804), *Mycetophila sordida* van der Wulp, 1874, *Phronia biarcuata* (Becker, 1908), *Rymosia beaucournui* Matile, 1963, and *Rymosia pseudocretensis* Burghele-Balacesco, 1966. The localities on which these records were based are given here.

Three other species were reported by Chandler and Ribeiro (1995) without specifying localities: *Cordyla crassicornis* Meigen, 1818, *Mycetophila britannica* Laštovka & Kidd, 1975, and *Mycetophila pictula* Meigen, 1830. The localities on which the records of *C. crassicornis* and *M. pictula* were based are also given here.

Recent records were added by Chandler and Blasco-Zumeta (2001) who described *Sciophila iberolutea* Chandler & Blasco-Zumeta, 2001 from Spain and also recorded specimens of the species in Morocco (Oued y Kern, locality). Thus, prior to the present study, there were 10 species recorded from Morocco.

This paper is the first contribution relating specifically to the Mycetophilidae species of Morocco. New findings increase the number of Moroccan Mycetophilidae to 64. Of these, 54 species of Mycetophilidae are recorded for the first time in Morocco of which 38 species are new to North Africa.

Material and methods

A total of 724 specimens of Mycetophilidae (576 males and 148 females) were collected using Malaise traps and by sweeping, between 2012 and 2018. Forty sites distributed over mountainous areas, such as the Rif, Beni Snassen, and Middle Atlas, were sampled.

Most of the material was collected by O. Banamar, O. Driauach, and B. Belqat. Additional material was provided by Dr M. Ebejer that he had collected in Morocco and some Moroccan Mycetophilidae deposited in the Natural History Museum London, UK (**BMNH**) and the Musée National d'Histoire Naturelle, Paris, France (**MNHN**). All the material preserved in 70% ethanol, was identified by P. Chandler. If not otherwise stated, the examined material is deposited in the Abdelmalek Essaâdi University, Tétouan, Diptera collection.

A list of sampling sites, with coordinates and altitudes, is given in Table 1, and the locations of the sites are shown in Figure 1, which was prepared with ArcGis (version 9.3).

A first checklist of Moroccan Mycetophilidae, in alphabetical order, is given to summarize the species inventory presently known from Morocco. One (*) asterisk indicates that the species is the first record from Morocco; two (**) asterisks indicate that the species represents the first record for Morocco and North Africa.

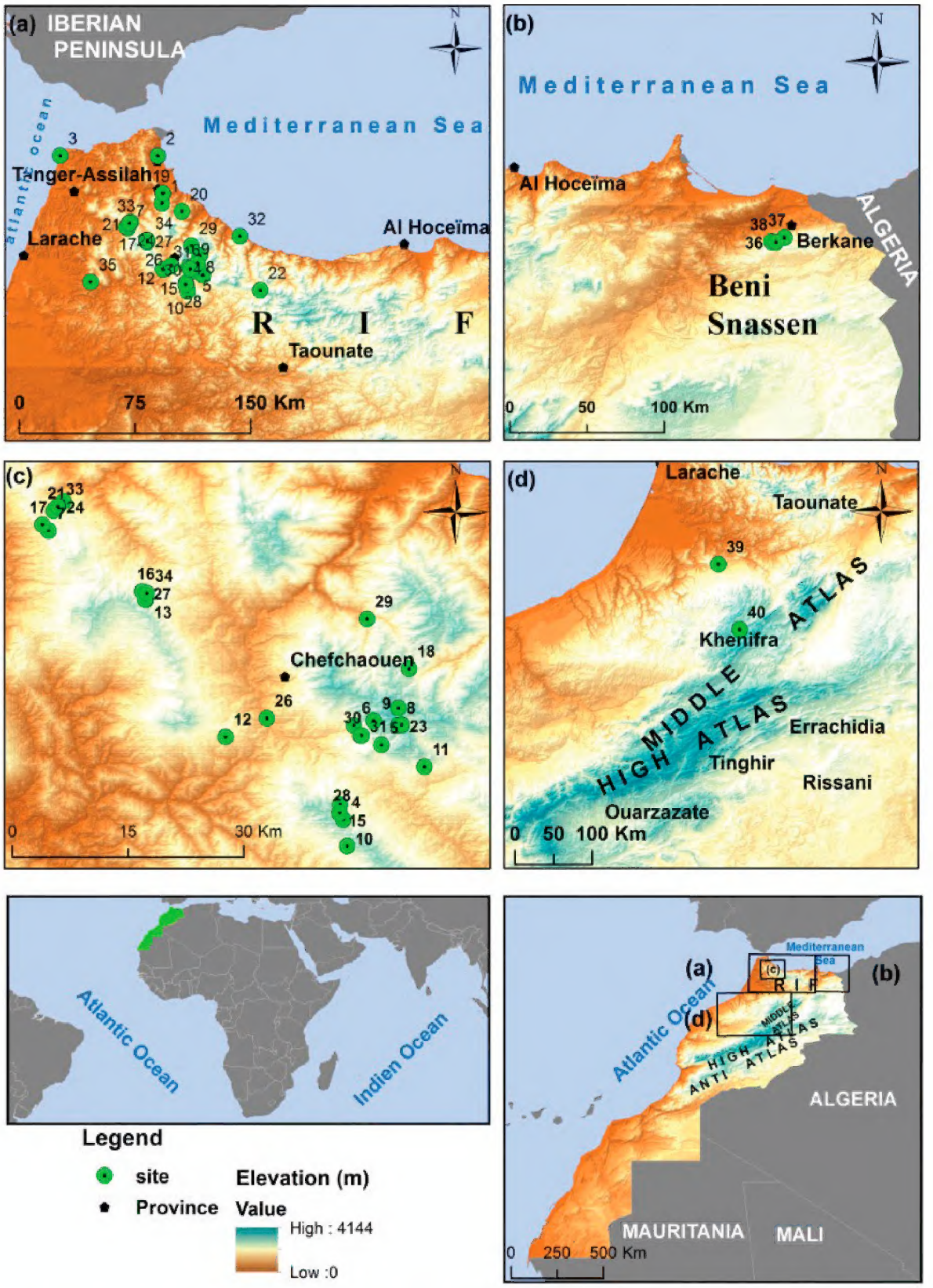

Figure 1. Map showing all collecting localities for Mycetophilidae in this study; numbers correspond to those in the Table 1.

List of species

Family Mycetophilidae
Subfamily Mycetophilinae
Tribe Exechiini
Genus *Allodiopsis* Tuomikoski, 1966

****Allodiopsis rustica*** **Edwards, 1941**

Literature records. Cited from North Africa (Tunisia) by Chandler et al. (2005).

Table 1. Sampling sites (in alphabetical order) harbouring the species collected in Morocco, in the present study, with localities, geographical coordinates and altitudes.

Province	Station	Locality	Elevation (m)	Geographical coordinates
Rif				
Tétouan	1. Marabout El Khaloua	Dar Khennouss	788	35°29.039'N, 5°20.678'W
Tanger	2. Grotte d'Hercule	Tanger	12	35°45.566'N, 5°56.350'W
Chefchaouen	3. Aïn El Ma Bared	Bouzthate	1267	35°00.333'N, 5°12.105'W
	4. Aïn El Malâab	Parc National Talassemtane	1278	35°05.509'N, 5°09.443'W
	5. Aïn Ras El Ma	Majjou	856	35°06.873'N, 5°11.388'W
	6. Aïn Sidi Brahim Ben Arrif	Larache	897	35°20.398'N, 5°32.712'W
	7. Aïn Takhninjoute	Bab Rouida	1512	35°06.881'N, 5°08.270'W
	8. Aïn Tiouila	Parc National Talassemtane	1502	35°07.194'N, 5°09.978'W
	9. Bab El Karne	Tamakoute	1248	34°58.510'N, 5°11.838'W
	10. Cascade Chrafate	Chrafate	820	35°03.997'N, 5°06.434'W
	11. Daya Afersiw	Mezine	303	35°06.069'N, 5°20.337'W
	12. Daya Amsemlil	Jbel Bouhachem	1059	35°15.596'N, 5°25.917'W
	13. Daya avant Taïda	Taïda	425	35°22.426'N, 5°31.662'W
	14. Daya Fifi	Fifi	1202	35°01.367'N, 5°12.335'W
	15. Daya Jbel Zemzem	Jbel Zemzem	216	35°45.457'N, 5°22.189'W
	16. Daya Mtahen	Jbel Bouhachem	966	35°16.195'N, 5°26.158'W
	17. Daya Tazia	Route Moulay Abdessalam	721	35°20.814'N, 5°33.139'W
	18. Douar Abou Boubnar (Marabout Sidi Gile)	Parc National Talassemtane	1247	35°10.812'N, 5°07.500'W
	19. Douar Kitane	Kitane	52	35°32.412'N, 5°20.393'W
	20. Douar Tizga	Amsa	516	35°26.237'N, 5°13.694'W
	21. Forêt-Adrou	Parc National Bouhachem	580	35°13.538'N, 5°19.405'W
	22. Forêt-Aïn Boughaba	Jbel Bou Bessoui	1526	34°58.779'N, 4°46.366'W
	23. Forêt-Jbel Lekraa	Parc National Talassemtane	1541	35°06.825'N, 5°08.077'W
	24. Forêt-Taghzoute	Parc National Bouhachem	556	35°22.056'N, 5°32.034'W
	25. Maison forestière	Parc National Talassemtane	1674	35°08.076'N, 5°08.262'W
	26. Oued Aârate	Dardara	269	35°07.381'N, 5°17.456'W
	27. Oued Amsemlil	Jbel Bouhachem	1059	35°15.614'N, 5°25.943'W
	28. Oued à 15 Km de Fifi	Bouzthate	1256	35°00.805'N, 5°12.365'W
	29. Oued Kelâa	Akchour	303	35°14.268'N, 5°10.452'W
	30. Oued Majjou	Majjou Village	799	35°06.186'N, 5°10.935'W
	31. Oued Majjou (Hafa Meqlouba)	Chefchaouen	825	35°06.175'N, 5°10.836'W
	32. Oued Sidi Yahya Aârab	Sidi Yahya Aârab	62	35°17.545'N, 4°53.503'W
	33. Oued Tisgris	Hmmadesh	490	35°22.079'N, 5°32.064'W
	34. Oued Tkarâa	Jbel Bouhachem	959	35°16.063'N, 5°25.829'W
	35. Route Ksar El Kébir-Chefchaouen	Tattofte	133	35°01.735'N, 5°45.593'W
Beni Snassen (Eastern Morocco)				
Berkane	36. Grotte des Pigeons	Beni Snassen	676	34°49.044'N, 5°24.329'W
	37. Grotte du Chameau	Beni Snassen	427	34°50.447'N, 2°21.532'W
	38. Oued Tafoughalt	Tafoughalt	751	34°48.941'N, 2°24.471'W
Middle Atlas				
Meknès	39. Aïn Walili	Sidi Moulay Idriss Zerhoun	490	34°03.216'N, 5°31.050'W
Ifrane	40. Forêt-3.5 km S. Azrou	Azrou	1450	33°25.491'N, 5°12.393'W

New record. Rif: Daya Tazia, 1♂ 12/V/2015.

Genus *Anatella* Winnertz, 1864

***Anatella concava* Plassmann, 1990

New record. Rif: Oued Aârate, 1♂, 26/III/2014.

Genus *Brevicornu* Marshall, 1896

**Brevicornu intermedium* (Santos Abréu, 1920)

Literature records. Cited from North Africa by Chandler and Ribeiro (1995).

New records. Rif: Forêt-Jbel Lekraa, 1♂, 12/VI/2013, coll. Ebejer; Oued Tisgris, 1♂, 25/III/2014; Oued Aârate, 1♂, 26/III/2014; Daya Tazia, 1♂, 25/IV/2014; Oued Majjou (Majjou Village), 2♂♂, 10/V/2014; Douar Tizga, 1♂, 25/VI/2014; Maison forestière, 2♂♂, 5♀♀, 07/VI-17/VI/2014, Malaise trap; Daya Jbel Zemzem, 1♂, 2/II/2015; Aïn Takhninjoute, 1♂, 21/IV/2015; Forêt-Adrou, 1♂, 25/IV/2015, coll. Ebejer; Daya Amsemlil, 2♂♂, 23/IV/2016.

***Brevicornu griseicolle* Staeger, 1840

New records. Rif: Daya Fifi, 1♂, 23/XI/2012; Oued Aârate, 1♂, 26/III/2014, 2♂♂, 07/V/2015; Daya Tazia, 1♂, 25/IV/2014; Oued Majjou (Majjou Village), 3♂♂, 7♀♀, 10/V/2014; Aïn El Malâab, 2♂♂, 2♀♀, 17/V/2014; Aïn El Malâab, 12♂♂, 17/V/2014; Maison forestière, 1♂7♀♀, 18/V/2014, 6♂♂, 17/VI/2014; Douar Tizga, 1♂, 25/VI/2014; Aïn Takhninjoute, 1♂, 21/IV/2015; Daya Amsemlil 1♂, 2♀♀, 23/IV/2016; Daya Mtahen, 1♂, 16/V/2016; Daya avant Taïda, 1♂, 20/IV/2018.

**Brevicornu sericoma* (Meigen, 1830)

Literature records. Recorded from North Africa (Tunisia) (Chandler and Ribeiro 1995; Chandler et al. 2005).

New records. Rif: Chefchaouen, VII/1975, 1♂, coll. J. Beaucournu (MNHN); Daya Fifi, 1♂, 23/XI/2012; Forêt-Jbel Lekraa, 1♂, 12/VI/2013, coll. Ebejer; Daya Fifi, 2♂♂, 26/III/2014; Oued Majjou (Majjou Village), 1♂, 10/V/2014; Maison forestière, 17/VI/2014; Douar Tizga, 1♂, 25/VI/2014; Oued Amsemlil, 2♂♂, 28/II/2015; Grotte d'Hercule, 3♂♂, 29/III/2015; Forêt-Adrou, 1♂, 25/IV/2015, coll. Ebejer; Cascade Chrafate, 1♂, 28/IV/2015; Oued Aârate, 10♂♂, 07/V/2015; Bab El Karne, 2♂♂, 25/XII/2015; Daya Amsemlil, 2♂♂, 16/V/2016.

**Brevicornu verralli* (Edwards, 1925)

Literature records. Recorded from North Africa (Tunisia) (Chandler 1994, Chandler and Ribeiro 1995).

New records. Rif: Daya Afersiw, 1♂, 11/VI/2013; Forêt-Jbel Lekraa, 1♂, 12/VI/2013, coll. Ebejer.

Genus *Cordyla* Meigen, 1803

Cordyla crassicornis Meigen, 1818

Literature records. Recorded from Morocco (Chandler and Ribeiro 1995), based on 1 male in MNHN, which was from Chefchaouen, VII/1975, coll. J. Beaucournu.

New records. Rif: Douar Abou Boubnar, 1♂, 18/V/2014; Maison forestière, 6♂♂, 1♀, 17/VI/2014, Forêt-Adrou, 1♂, 25/IV/2015, coll. Ebejer; Oued Sidi Yahya Aârab, 1♂, 1♀, 25/IV/2015, coll. Ebejer. Beni Snassen: Oued Tafoughalt, 1♂, 25/XII/2014.

***Cordyla insons* Laštovka & Matile, 1974

New record. Rif: Oued Majjou (Majjou Village), 1♂, 09/IV/2013.

***Cordyla murina* Winnertz, 1864

New record. Rif: Forêt-Aïn Boughaba, 1♂, 24/V/2013.

***Cordyla styliforceps* (Bukowski, 1934)

New records. Rif: Maison forestière, 1♂, 4/VII/2013, 12♂♂, 17/VI/2014, 1♂, 17/III/2015; Oued Tkarâa, 1♂, 1♀, 16/V/2016; Oued Sidi Yahya Aârab, 1♂, 25/IV/2015.

Genus *Exechia* Winnertz, 1864

***Exechia bicincta* (Staeger, 1840)

New records. Rif: Oued Kelâa, 1♀, 13/II/2013; Oued Aârate, 1♀, 26/III/2014. Beni Snassen: Grotte des pigeons, 1♂, 25/XII/2014; Oued Tafoughalt, 1♂, 25/XII/2014.

***Exechia dorsalis* (Staeger, 1840)

New record. Rif: Bab El Karne, 1♂, 25/XII/2016.

Exechia fulva Santos Abreu, 1920

= *Rymosia exornata* Séguy in Séguy 1941: 26

Literature records. Cited from Morocco: High Atlas, Toubkal (Séguy 1941, Chandler and Ribeiro 1995).

New records. Rif: 20 km west of Targuist, Ketama, 23/IV/1966, 6♂♂, 3♀♀, coll. A.M. Hutson (BMNH); Chefchaouen, VII/1975, 21♂♂, 20♀♀, coll. J. Beaucournu (MNHN); Oued Kelâa, 4♂♂, 4♀♀, 13/II/2013; Forêt-Aïn Boughaba, 7♂♂, 5♀♀, 24/V/2013; Forêt-Jbel Lekraa, 1♂, 12/VI/2013, coll. Ebejer; Daya Fifi, 14♂♂, 11♀♀, 26/III/2014; Aïn Sidi Brahim Ben Arrif, 1♂, 25/IV/2014; Oued Majjou (Majjou Village), 1♂, 10/V/2014; Aïn Takhninjoute, 4♂♂, 1♀, 17/V/2014; Maison forestière, 37♂♂, 32♀♀, 07/VI-17/VI/2014, Malaise trap; Oued Amsemlil, 2♂♂, 3♀♀, 28/II/2015; Daya Jbel Zemzem, 1♂, 02/III/2015; Aïn Takhninjoute, 4♂♂, 21/IV/2015; Bab El Karne, 22♂♂, 4♀♀, 25/XII/2015; Daya Fifi, 3♂♂, 5♀♀, 25/XII/2015; Daya Amsemlil, 2♂♂, 23/IV/2016.

**Exechia fusca* (Meigen, 1804)

Literature records. Cited from North Africa (Tunisia) (Chandler 1994; Chandler and Ribeiro 1995).

New records. Rif: Oued Kelâa, 2♂♂, 13/II/2013; Forêt-Jbel Lekraa, 1♂, 12/VI/2013, coll. Ebejer; Douar Kitane, 1♂, 01/I/2015; Daya Amsemlil, 1♂, 23/IV/2016.

Genus *Exechiopsis* Tuomikoski, 1966

**Exechiopsis coremura* (Edwards, 1928)

Literature records. Cited from North Africa (Algeria) (Hackman et al. 1988).

New record. Rif: Cascade Chrafate, 1♂, 1♀, 28/IV/2015.

Genus *Pseudexechia* Tuomikoski, 1966

***Pseudexechia tuomikoskii* (Kjærandsen, 2009)

New record. Rif: Source Aheramen, 1♂, 10/V/2014.

Genus *Rymosia* Winnertz, 1864

**Rymosia affinis* Winnertz, 1864

Literature records. Cited from North Africa (Algeria) (Burghele-Balacesco 1967).

New records. Rif: Maison forestière, 1♀, 17/VI/2014; Daya Amsemlil, 1♂, 28/II/2015; Aïn Tiouila, 1♂, 02/V/2015; Daya Fifi, 1♂, 25/XII/2015.

Rymosia beaucournui Matile, 1963

Literature records. Cited from Morocco (Chandler and Ribeiro 1995; Chandler et al. 2005). Records of the species (9 males, 3 females) based on specimens in MNHN from Rabat, Oued y Kern, V/1973, coll. H. Choumara.

New record. Beni Snassen: Grotte des pigeons, 1♂, 25/XI/2014.

Rymosia pseudocretensis Burghele-Balacesco, 1966

Literature records. Cited from Morocco (Chandler 1994; Chandler et al. 2005), based on a specimen (1 male) in MNHN from Rabat, Oued y Kern, V/31973, coll. H. Choumara.

Genus *Stigmatomeria* Tuomikoski, 1966

***Stigmatomeria crassicornis* (Stannius, 1831)

New records. Rif: Chefchaouen, VII/1975, 1♀, coll. J. Beaucournu, MNHN; Forêt-Jbel Lekraa, 1♂, 12/VI/2013, coll. Ebejer; Daya Fifi, 1♀, 26/III/2014; Aïn Takhninjoute, 1♂, 17/V/2014; Maison forestière, 1♂, 18/V/2014, 1♀, 17/VI/2014; Daya Amsemlil, 1♂, 23/IV/2016.

Genus *Tarnania* Tuomikoski, 1966

**Tarnania dziedzickii* (Edwards, 1941)

Literature records. Cited from North Africa (Algeria) (Burghele-Balacesco 1967).

New records. Rif: Maison forestière, 1♀, 18/V/2014; Daya Amsemlil, 1♂, 28/II/2015; Cascade Chrafate, 1♂, 1♀, 28/IV/2015; Daya Amsemlil, 1♀, 23/IV/2016. Grotte-Aïn El-Aouda, 1♂, 1♀, 2/V/1914, MNHN.

Tribe Mycetophilini

***Mycetophila alea* Laffoon, 1965

New records. Rif: Chefchaouen, VII/1975, 13♂♂, 6♀♀, coll. J. Beaucournu, MNHN; Aïn El Ma Bared, 1♀, 06/V/2014; Maison forestière, 1♂, 3♀♀, 17/VI/2014; Oued Aârate, 3♂♂, 07/V/2015; Bab El Karne, 2♂♂, 25/XII/2015.

Mycetophila britannica Laštovka & Kidd, 1975

Literature records. Recorded from Morocco (Chandler and Ribeiro 1995), based on material in MNHN, for which precise locality data was not noted.

New records. Rif: Forêt-Aïn Boughaba, 2♂♂, 24/V/2013; Forêt-Jbel Lekraa, 2♂♂, 1♀, 12/VI/2013, coll. Ebejer; Douar Kitane, 1♂, 13/III/2014, Malaise trap; Aïn El Malâab, 11♂♂, 17-V-2014; Aïn Takhninjoute, 1♂, 17/V/2014; Oued à 15 km de Fifi, 2♂♂, 06/V/2014; Aïn El Ma Bared, 3♀♀, 06/V/2014; Maison forestière, 2♀♀, 18/V/2014; Oued Majjou (Hafa Meqlouba), 1♂, 10/V/2014; Oued Majjou (Majjou Village), 1♂, 10/V/2014; Aïn Takhninjoute, 1♂, 17/V/2014; Maison forestière, 2♀♀, 17/VI/2014; Grotte d'Hercule, 3♂♂, 2♀♀, 29/III/2015; Aïn Takhninjoute, 1♂, 21/IV/2015, 1♂, 24/VI/2015; Oued Aârate, 1♂, 07/V/2015; Bab El Karne, 1♂, 25/XII/2015; Daya Amsemlil, 1♀, 1♂, 23/IV/2016; Daya Mtahen, 1♂, 16/V/2016; Daya avant Taïda, 1♀, 20/IV/2018; Forêt-Taghzoute, 1♂1♀, 25/IV/2015, coll. Ebejer.

*****Mycetophila deflexa*** **Chandler, 2001**

New records. Forêt-Taghzoute, 1♂, 25/IV/2015; Route Ksar El Kébir-Chefchaouen, 2♂♂, 5/VI/2013, coll. Ebejer.

*****Mycetophila edwardsi*** **Lundström, 1913**

New records. Rif: Daya Fifi, 2♂♂, 26/III/2014; Daya Tazia, 1♀, 25/IV/2014; Oued Tkarâa, 1♀, 16/V/2016; Forêt-Jbel Lekraa, 1♀, 12/VI/2013, coll. Ebejer; Forêt-Taghzoute, 1♀, 25/IV/2015, coll. Ebejer. Beni Snassen: Grotte d'Hercule, 1♀, 29/III/2015.

*****Mycetophila formosa*** **Lundström, 1911**

New records. Rif: Forêt-Jbel Lekraa, 1♂, 12/VI/2013, coll. Ebejer; Oued Amsemlil, 1♂, 28/II/2015, Daya Amsemlil, 1♂, 25/XII/2015; Daya Amsemlil, 2♂♂, 23/IV/2016; Daya avant Taïda, 1♂, 20/IV/2018.

*****Mycetophila marginata*** **Winnertz, 1864**

New records. Rif: Chefchaouen, VII/1975, 4♂♂, coll. J. Beaucournu, MNHN; Aïn Ras El Ma, 1♂, 3/V/2013; Oued Majjou (Majjou Village), 3♂♂, 10/V/2014; Maison forestière, 1♂, 17/VI/2014; Daya Amsemlil, 3♂♂, 23/IV/2016.

****Mycetophila perpallida*** **Chandler, 1993**

Literature records. Cited from North Africa (Chandler 2009).

New records. Rif: Forêt-Aïn Boughaba, 1♂, 1♀, 24/V/2013; Aïn El Malâab, 1♂, 14/VII/2013; Maison forestière, 2♂♂, 17/VI/2014; Bab El Karne, 1♂, 25/XII/2015; Daya Amsemlil, 3♂♂, 1♀, 23/IV/2016; Douar Kitane, 5♂♂, 1♀, 29/XII/2016.

Mycetophila pictula Meigen, 1830

Literature record. Cited from Morocco (Chandler and Ribeiro 1995), based on 1 male and 2 females in MNHN, which were from Chefchaouen, VII/1975, coll. J. Beaucournu.

New record. Rif: Forêt-Jbel Lekraa, 1♀, 12/VI/2013, coll. Ebejer; Oued Majjou (Majjou Village), 1♂, 10/V/2014.

Mycetophila sordida van der Wulp, 1874

Literature record. Cited from Morocco (Chandler 1994), based on 1 male in MNHN, which was from maison forestière de Khenolap-el-Ouaer, 1580 m, VII/1975, coll. J. Beaucournu.

New record. Rif: Forêt-Jbel Lekraa, 1♂, 12/VI/2013, coll. Ebejer.

*******Mycetophila spectabilis* Winnertz, 1864

New records. Rif: Forêt-Jbel Lekraa, 1♂, 12/VI/2013, coll. Ebejer; Forêt-Aïn Boughaba, 1♂, 24/V/2013; Oued à 15 km de Fifi, 1♂, 06/V/2014; Aïn El Malâab, 1♂, 17/VI/2014.

**Mycetophila strigatoides* (Landrock, 1927)

Literature records. Cited from North Africa (Tunisia) (Chandler 1994).

New records. Rif: Forêt-Taghzoute, 1♂, 25/IV/2015, coll. Ebejer; Oued Aârate, 1♂, 26/III/2014.

*******Mycetophila unicolor* Stannius, 1831

New record. Rif: Oued Kelâa, 1♂, 13/II/2013.

*******Mycetophila vittipes* Zetterstedt, 1852

New records. Rif: Forêt-Jbel Lekraa, 2♂♂, 12/VI/2013, coll. Ebejer; Maison forestière, 1♂, 1♀, 18/V/2014, Daya Amsemlil, 7♂♂, 25/IV/2016.

Genus *Phronia* Winnertz, 1864

Phronia biarcuata (Becker, 1908)

Literature records. Recorded from Morocco (Chandler 1994; Chandler and Ribeiro 1995, Chandler et al. 2005), based on specimens in MNHN, which were from Chefchaouen, VII/1975, coll. J. Beaucournu.

New records. Rif: Daya Tazia, 1♂, 25/IV/2014; Aïn El Ma Bared, 1♀, 06/V/2014; Aïn El Malâab, 1♀, 17/V/2014; Aïn Takhninjoute, 1♂, 17/V/2014, 1♀, 21/IV/2015; Maison forestière, 1♂, 17/VI/2014; Grotte d'Hercule, 1♂, 29/III/2015; Daya Amsemlil, 4♂♂, 3♀♀, 23/IV/2016.

****Phronia cinerascens* Winnertz, 1864**

New record. Rif: Daya Amsemlil, 1♂, 28/II/2015.

****Phronia nitidiventris* (van der Wulp, 1858)**

New records. Rif: Daya Afersiw, 1♂, 11/VI/2013; Oued Aârate, 1♂, 26/III/2014.

***Phronia tenuis* Winnertz, 1864**

Literature records. Recorded from North Africa (Tunisia and Algeria) (Chandler 1994).

New records. Rif: Oued Kelâa, 1♂, 1♀, 13/II/2013; Oued Aârate, 1♂, 3♀♀, 26/III/2014, 1♂, 07/V/2015; Oued Majjou (Majjou Village), 1♂, 10/V/2014; Aïn Takhninjoute, 2♂♂, 17/V/2014; Grotte d'Hercule, 1♂, 29/III/2015.

****Phronia tyrrhenica Edwards, 1928**

New records. Rif: Forêt-Jbel Lekraa, 1♂, 12/VI/2013, coll. Ebejer; Maison forestière, 1♂, 18/V/2014; Daya Amsemlil, 2♂♂, 28/II/2015; Aïn Takhninjoute, 6♂♂, 5♀♀, 21/IV/2015; Daya Amsemlil, 3♂♂, 1♀, 23/IV/2016.

****Phronia willistoni Dziedzicki, 1889**

New records. Rif: Forêt-Jbel Lekraa, 1♂, 12/VI/2013, coll. Ebejer; Oued Aârate, 1♂, 26/III/2014; Maison forestière, 1♂, 1♀, 18/V/2014; Daya Amsemlil, 3♂♂, 3♀♀, 28/II/2015, 1♂, 1♀, 23/IV/2016; Cascade Chrafate, 1♂, 28/IV/2015; Bab El Karne, 14♂♂, 1♀, 25/XII/2015.

Genus *Sceptonia* Winnertz, 1864

***Sceptonia intestata* Plassmann & Schacht, 1990

New records. Rif: Maison forestière, 1♂, 17/VI/2014; Aïn El Malâab, 1♂, 17/V/2014.

***Sceptonia membranacea* Edwards, 1925

New records. Rif: Oued à 15 km de Fifi, 2♂♂, 06/V/2014; Oued Aârate, 1♂, 07/V/2015.

Genus *Trichonta* Winnertz, 1864

***Trichonta foeda* Loew, 1869

New records. Rif: Aïn Takhninjoute, 1♂, 21/IV/2015; Bab El Karne, 3♂♂, 1♀, 25/XII/2015; Daya Amsemlil, 1♂, 23/IV/2016; Oued Tkarâa, 1♂, 16/V/2016.

***Trichonta icenica* Edwards, 1925

New record. Beni Snassen: Grotte du chameau, 1♂, 24/XI/2015.

**Trichonta vitta* (Meigen, 1830)

Literature records. Recorded from North Africa (Algeria) (Hackman et al. 1988; Chandler 1994).

New records. Rif: Forêt-Jbel Lekraa, 1♀, 12/VI/2013, coll. Ebejer; Bab El Karne, 1♂, 25/XII/2015.

***Trichonta vulcani* Dziedzicki, 1889

New record. Beni Snassen: Grotte du Chameau, 1♂, 24/XI/2015.

Genus *Zygomyia* Winnertz, 1864

***Zygomyia humeralis* (Wiedemann, 1817)

New record. Rif: Maison forestière, 1♂, 17/VI/2014.

****_Zygomyia valida_ Winnertz, 1864**

New records. Rif: Aïn Ras El Ma, 1♂, 1♀, 3/V/2013; Oued Aârate, 1♂, 26/III/2014.

Subfamily Leiinae
Genus *Docosia* Winnertz, 1864

****_Docosia gilvipes_ (Walker, 1856)**

New records. Rif: Forêt-Jbel Lekraa, 1♂, 12/VI/2013, coll. Ebejer; Maison forestière, 1♂, 07/VI-17/X/2014, Malaise trap; Maison forestière, 1♂, 17/VI/2014; Aïn Takhninjoute, 1♂, 21/IV/2015; Daya Amsemlil, 1♀, 23/IV/2016.

Genus *Leia* Meigen, 1818

***_Leia arsona_ Hutson, 1978**

Literature records. Cited from North Africa (Tunisia) (Chandler 1994; Chandler and Gatt 2000).

New records. Rif: Oued Majjou (Majjou Village), 1♂, 09/IV/2013; Oued Sidi Yahya Aârab, 1♀, 25/IV/2015. Middle Atlas: Aïn Walili, 1♂, 18/II/2016.

***_Leia beckeri_ Landrock, 1940**

Literature records. Cited from North Africa (Algeria) (Hackman et al. 1988; Chandler 2009).

New record. Rif: Aïn Ras El Ma, 1♀, 27/III/2013.

***Leia bimaculata* (Meigen, 1804)**

Literature records. Cited from Morocco (Chandler et al. 2005), based on 1♂ and 1♀ from Forêt-Ifrane, 12/V/1961, coll. P.N. Lawrence (BMNH).

New records. Rif: Daya Tazia, 1♂, 25/IV/2014; Maison forestière, 1♂, 07/VI-17/X/2014, Malaise trap; Aïn El Ma Bared, 1♂, 25/XII/2015. Middle Atlas: Forêt-3.5 km S. Azrou, 1♀, 8/V/2012, coll. Ebejer.

Genus *Novakia* Strobl, 1893

***_Novakia scatopsiformis_ Strobl, 1893**

Literature records. Cited from North Africa (Tunisia) (Hackman et al. 1988; Chandler 1994).

New record. Rif: Maison forestière, 10♂♂, 1♀, 07/VI-17/VI/2014, 1♂, 17/XI/2015, Malaise trap.

*****Novakia simillima* Strobl, 1910**

New records. Rif: Oued Aârate, 1♂, 26/III/2014; Maison forestière, 11♂♂, 07/VI-17/VI/2014, 9♂♂, 17/XI/2015, Malaise trap.

Subfamily Gnoristinae
Genus *Boletina* Staeger, 1840

*****Boletina gripha* Dziedzicki, 1885**

New records. Rif: Daya Fifi, 3♂♂, 23/XI/2012; Oued Aârate, 1♂, 26/III/2014; Daya Fifi, 1♂, 26/III/2014; Aïn Sidi Brahim Ben Arrif, 1♂, 25/IV/2014; Daya Amsemlil, 2♂♂, 28/II/2015; Grotte d'Hercule, 1♂, 29/III/2015, Cascade Chrafate, 2♂♂, 28/IV/2015; Oued Sidi Yahya Aârab, 1♂, 25/IV/2015; Aïn El Ma Bared, 2♂♂, 25/XII/2015; Bab El Karne, 2♀♀, 25/XII/2015. Middle Atlas: Forêt-3.5 km S. Azrou, 2♂♂, 8/V/2012, coll. Ebejer.

Genus *Coelosia* Winnertz, 1864

*****Coelosia fusca* Bezzi, 1892**

New records. Rif: Daya Fifi, 1♀, 23/XI/2012; Oued Kelâa, 1♂, 13/II/2013; Daya Fifi, 1♂, 26/III/2014; Oued Amsemlil, 2♂♂, 2♀♀, 28/II/2015, 1♂, 31/I/2017; Aïn Takhninjoute, 1♂, 21/IV/2015; Cascade Chrafate, 2♂♂, 28/IV/2015; Bab El Karne, 1♀, 25/XII/2015; Daya Amsemlil, 1♀, 23/IV/2016; Daya avant Taïda, 2♂♂, 20/IV/2018.

Genus *Synapha* Meigen, 1818

*****Synapha fasciata* Meigen, 1818**

New records. Rif: Aïn Sidi Brahim Ben Arrif, 1♂, 25/IV/2014; Daya Tazia, 1♂, 25/IV/2014; Forêt-Adrou, 1♀, 25/IV/2015, coll. Ebejer; Daya Amsemlil, 1♂, 23/IV/2016; Daya avant Taïda, 1♂, 20/IV/2018.

*****Synapha vitripennis* (Meigen, 1818)**

New record. Rif: Daya Amsemlil, 1♂, 23/IV/2016.

Genus *Tetragoneura* Winnertz, 1846

*******Tetragoneura ambigua* Grzegorzek, 1885**

New records. Rif: Forêt-Aïn Boughaba, 1♂, 24/V/2013. Beni Snassen: Oued Tafoughalt, 1♂, 25/XII/2014.

Subfamily Mycomyinae
Genus *Mycomya* Rondani, 1856

*******Mycomya flavicollis* (Zetterstedt, 1852)**

New records. Rif: Aïn El Malâab, 1♂, 17/V/2014; Maison forestière, 40♂♂, 2♀♀, 07/VI-17/VI/2014, Malaise trap.

*******Mycomya pygmalion* Väisänen, 1984**

New records. Rif: Oued Amsemlil, 6♂♂, 1♀, 28/II/2015; Aïn Sidi Brahim Ben Arrif, 2♂♂, 25/IV/2014.

*******Mycomya tumida* (Winnertz, 1864)**

New record. Rif: Daya Fifi, 2♂♂, 26/III/2014.

Subfamily Sciophilinae
Genus *Azana* Walker, 1856

******Azana anomala* Staeger, 1840**

Literature records. Cited from North Africa (Algeria) (Hackman et al. 1988).

New records. Rif: Oued Majjou (Majjou Village), 1♂, 09/IV/2013; Maison forestière, 46♂♂, 1♀, 17/VI/2014.

Genus *Sciophila* Meigen, 1818

***Sciophila iberolutea* Chandler & Blasco-Zumeta, 2001**

Literature records. Cited from Morocco: Rabat, Oued y Kern, V/1973, coll. H. Choumara, MNHN: (Chandler and Gatt 2000; Chandler and Blasco-Zumeta 2001, Bechev and Koç 2006).

New records. Rif: Maison forestière, 1♂, 4/VII/2013, 4♂♂, 2♀♀, 07/VI-17/X/2014, Malaise trap, 1♂, 1♀, 17/VI/2014; Daya Jbel Zemzem, 1♂, 02/III/2015; Oued Sidi Yahya Aârab, 1♂, 25/IV/2015; Bab El Karne, 1♂, 25/XII/2015; Marabout El Khaloua, 1♂, 03/VI/2018.

Discussion

The majority of the species recorded here are widespread in the Mediterranean region and also more widely in Europe and the Palaearctic Region. In addition to these, 10 species considered to be new to science were also found, and these will be treated elsewhere. These new species belong to the genera *Rymosia*, *Docosia*, *Leia*, *Megophthalmidia*, *Ectrepesthoneura*, and *Mycomya*; *Docosia* and *Megophthalmidia* in particular are diverse in the Mediterranean region, and the discovery of additional species in North Africa is not surprising. A female of *Allocotocera* resembling the Greek *A. scheria* Chandler, Bechev & Caspers, 2005 was also found, but males will be needed to establish if it is conspecific with *A. scheria*.

Knowledge of the North African Mycetophilidae is otherwise poor, with a relatively small number of species recorded from Algeria and Tunisia. Seven species were recorded from Algerian caves by Burghele-Balacesco (1967), while the citation of others (Chandler 1994; Chandler and Ribeiro 1995; Chandler and Gatt 2000; Chandler et al. 2005) was based on specimens in the collections of MNHN and BMNH. Altogether, only 21 species have been recorded from Algeria and 13 species from Tunisia, with a combined total of 31 species, of which 19 are in common with the present Moroccan list. The additional 12 species are all widespread in Europe, and can also be expected to occur in Morocco. The Atlantic Islands fauna was dealt with by Chandler and Ribeiro (1995), with four species added by Chandler and Báez (2002); of the 68 species recorded, 23 are in common with Morocco, while 27 are apparently endemic to the islands. Of the 39 species found in the Canary Islands, 16 are in common with Morocco and 13 are island endemics.

The Mycetophilidae of the Iberian Peninsula are much better known, with published records of 247 species, but this is a diverse region for which a direct comparison is not practical, and compared to other European countries, a much greater total can be expected with more recording. Not surprisingly, 56 of the species recorded here from Morocco are in common with the Iberian Peninsula. Otherwise, the study of the Mediterranean fauna has been piecemeal, but there have been detailed accounts of the fauna of Israel (Chandler 1994: 64 species, 28 also in Morocco), Malta (Chandler and Gatt 2000: 21 species, 11 in Morocco), Greece and Cyprus (Chandler et al. 2005: 151 species, 46 in Morocco; for Cyprus 54 species, 25 in Morocco) and Sardinia (Chandler 2009: 102 species, 44 in Morocco). Thus, more than 40% of the species for each studied country or region are in common with Morocco, except for the larger land areas of mainland Greece and the Iberian Peninsula where more central European species are expected to be present.

Moroccan species whose distribution is entirely or principally Mediterranean are the following, with the distribution outside Morocco stated in each case:

Anatella concava (Corsica, mainland Spain)
Cordyla styliforceps (Canary Islands, widespread in southern Europe, most northerly Switzerland and Ukraine (Crimea))
Exechiopsis coremura (Algeria, Corsica, Iberian Peninsula)
Leia beckeri (Canary Islands, Algeria, mainland Spain, Sardinia)
Rymosia beaucournui (Iberian peninsula, Sardinia, Greece including Lesbos and Crete, southern France and Switzerland)
R. pseudocretensis (Iberian Peninsula, southern France, mainland Italy, Crete)
Phronia tyrrhenica (mainland Spain, Corsica, Greece, Cyprus, southern France and Switzerland)
Sceptonia intestata (mainland Spain, Greece, Cyprus)
Novakia simillima (mainland Spain, most northerly Austria)
Mycomya pygmalion (Iberian Peninsula, Greece including Crete, Cyprus, Lebanon, Israel)
Sciophila iberolutea (mainland Spain, Malta).

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References

Bechev D, Koç H (2006) Two new species of *Sciophila* Meigen (Diptera: Mycetophilidae) from Turkey, with a key to the Western Palaearctic species of the *S. lutea* Macquart group. Zootaxa 1253: 61–68.

Burghele-Balacesco A (1967) Les Mycetophilidae (diptères) cavernicoles de la collection Biospeologica (IVe–VIIIe séries des «Grottes visitées»). International Journal of Speleology 2(4): 319–334. https://doi.org/10.5038/1827-806X.2.4.3

Chandler PJ (1994) The fungus gnats of Israel (Diptera: Sciaroidea, excluding Sciaridae). Israel Journal of Entomology 28: 1–100.

Chandler PJ (2009) The fungus gnats (Diptera: Bolitophilidae, Keroplatidae, Mycetophilidae) of Sardinia, with description of six new species. In: Cerretti P, Mason F, Minelli A, Nardi G, Whitmore D (Eds) Research on the terrestrial arthropods of Sardinia (Italy). Zootaxa 2318: 450–506. https://doi.org/10.11646/zootaxa.2318.1.19

Chandler PJ, Ribeiro E (1995) The Sciaroidea (Diptera) (excluding Sciaridae) of the Atlantic Islands (Canary Islands, Madeira and the Azores). Boletim do Museu municipal do Funchal (História Natural), Suplemento 3: 1–170.

Chandler PJ, Gatt P (2000) Fungus gnats (Diptera, Bolitophilidae, Keroplatidae and Mycetophilidae) from the Maltese Islands. Studia dipterologica 7: 69–81.

Chandler PJ, Báez M (2002) Mycetophilidae. In: Carles-Tolrá Hjorth-Andersen M (Ed.) Catálogo de los Diptera de España, Portugal y Andorra (Insecta). Monografías Sociedad Entomológica Aragonesa 8: 59–64.

Chandler P, Blasco-Zumeta J (2001) The fungus gnats (Diptera, Bolitophilidae, Keroplatidae and Mycetophilidae) of the Monegros Region (Zaragoza, Spain) and five other new European species of *Pyratula* Edwards and *Sciophila* Meigen. Zapateri 9: 1–24.

Chandler PJ, Bechev DN, Caspers N (2005) The fungus gnats (Diptera: Bolitophilidae, Diadocidiidae, Ditomyiidae, Keroplatidae and Mycetophilidae) of Greece, its islands and Cyprus. Studia Dipterologica 12: 255–314.

Hackman W, Laštovka P, Matile L, Väisänen R (1988) Family Mycetophilidae (Fungivoridae). In: Soós A, Papp L (Eds) Catalogue of Palaearctic Diptera (Vol. 3), Ceratopogonidae-Mycetophilidae. Elsevier, Amsterdam, 220–327.

Hutson AM, Ackland DM, Kidd LN (1980) Mycetophilidae (Bolitophilinae, Ditiomyiinae, Diadocidiinae, Keroplatinae, Sciophilinae and Manotinae). Diptera, Nematocera. Handbooks for Identification of British Insects 9: 1–109.

Pape T, Blagoderov V, Mostovski MB (2011) Order Diptera Linnaeus, 1758. In: Zhang Z-Q (Ed.) Animal biodiversity: an outline of higher-level classification and survey of taxonomic richness. Zootaxa 3148: 222–229. https://doi.org/10.11646/zootaxa.3148.1.42

Séguy E (1941) Recoltes de R. Paulian et A. Villers dans le haut Atlas marocain, 1938, 17, Dipteres. Revue Francaise d'Entomologie 8: 25–33.

Søli GE, Vockeroth JR, Matile L (2000) A. 4. Families of Sciaroidea. In: Papp L, Darvas B (Eds) Contributions to a Manual of Palaearctic Diptera. Appendix. Science Herald, Budapest, 49–92.

Yakovlev EB (1994) Palearctic Diptera associated with fungi and myxomycetes. Karelian Research Center, Russian Academy of sciences, Forest Research Institute, Petrozavodsk, 127 pp. [In Russian, with English summary.]